VALLEY

GPS Guidance System
Control Panel
Owner's Manual

For
Software Version 2.00

0998902_A

Valley GGS Control Panel

Table of Contents

Valley GGS Control Panel

Table of Contents

EC Declaration Of Conformity

CE

We: **Valmont Industries, Inc.**
28800 Ida Street
Valley, NE 68064
+1 402.359.6312
+1 402.359.6143 (Facsimile)

Serial Number:

Purchase Order:

declare under our sole responsibility that the product,

Crop Irrigation System

to which this documentation relates, is in conformity with the following documents:

Machinery Directive   2006/42/EC
Low Voltage Directive 2006/95/EC
Electromagnetic Compatibility Directive 2004/108/EC

The above-referenced equipment is in conformity with all safety-related clauses (Not all clauses reflecting commercial preference are met) of the following documents:

EN 60204-1:2006   **Safety of Machinery – Electrical Equipment of Machines**
EN 12100:2010   **Safety of Machinery**
EN 909:1998+A1   **Irrigation Machines**

Statement regarding **Pressure Equipment Directive 97/23/EC:**

The Crop Irrigation System is excluded from the scope of the Pressure Equipment Directive, by the language of Article 1, Sections 3.2, 3.6 & 3.10. This equipment is classified less than Category 1.

Statement regarding **RoHS Directive 2011/65/EC**:

The Crop Irrigation System is excluded from the scope of the RoHS Directive, by the language of Article 2, Section 4(e), being a "Large Scale Fixed Installation."

Person Authorized to Compile the Technical File in Europe:
Relevant information will be transmitted via e-mail
in response to a reasoned request by national authorities

Philipp Schmidt-Holzmann
Valmont S.A.U.
28840 Mejorada del Campo
Madrid, ES 28840
+34 91 679 4300

Ron Pollak
Senior Electrical Engineer
Valmont Industries, Inc.

Date of Issue: March 9, 2015
Place of Issue: Valley, NE 68064

Valley GGS Control Panel

About This Manual

Information contained in this manual applies to all Valley GPS Guidance System (GGS) Control Panel with software version 2.00.

For proper operation of the irrigation machine, the GGS Control Panel Owner's Manual, the machine Control Panel Owner's Manual and Irrigation Machine Owner's Manual must be used together.

The Control Panel Owner's Manual includes safety guidelines and explains the basic operation of the machine control panel itself.

The Irrigation Machine Owner's Manual includes safety guidelines and explains the operation of the irrigation machine.

All owner's, operators and maintenance personnel MUST read and understand the GGS Control Panel Owner's Manual, the machine Control Panel Owner's Manual and Irrigation Machine Owner's Manual.

Specifications, descriptions and illustrative material contained herein were as accurate as known at the time this publication was approved for printing. Valmont Industries Inc., reserves the right to change specification or design without incurring obligation. Specifications are applicable to machines sold in the United States and may vary outside the United States.

Ancillary Equipment Warranty

The owner is responsible for warranty registration of all ancillary equipment such as engines, pumps and generators with its respective manufacturer.

Recognize Safety Information

This irrigation equipment can be powered by high voltage, which can be extremely dangerous if used improperly. For maximum safety and optimum performance of the machine, all owner/operators and maintenance personnel must read and understand the owner/operator manual(s), all safety messages in this manual and safety signs/decals on the machine before operating this equipment.

Anyone assembling, operating, servicing or maintaining this machine must read and understand all operation, maintenance, troubleshooting, testing, installation, assembly instructions and all safety messages in this manual before operating the machine or beginning any maintenance, troubleshooting, testing, installation or assembly of components.

These instructions alert you to certain things you should do carefully; if you don't, you could hurt yourself or others, hurt the next person who operates the equipment, or damage the equipment.

Safety Messages

Safety messages in this manual are preceded by the hazard symbol and one of three words: DANGER, WARNING or CAUTION. These messages alert you to potential hazards that could hurt you or others and or cause property damage.

⚠   This HAZARD SYMBOL is used to alert you to information about unsafe actions or situations, and may be followed by the word DANGER, WARNING or CAUTION.

⚠ DANGER

The HAZARD SYMBOL used with the word DANGER describes immediate hazards that can result in severe personal injury or death.

⚠ WARNING

The HAZARD SYMBOL used with the word WARNING describes unsafe actions or situations that can result in severe injury, death and/or major equipment or property damage.

⚠ CAUTION

The HAZARD SYMBOL used with the word CAUTION describes unsafe actions or situations that can result in injury, and/or minor equipment or property damage.

Information Messages

Important information messages in this manual are preceded by the word NOTE.

NOTE

The word NOTE is used to alert you to information that describes procedures or tips to help you install, operate or maintain your equipment properly.

Valley GGS Control Panel

Safety
Use of Personal Protective Equipment

• People working in areas where there are potential electrical hazards must use, personal protective equipment that is appropriate for the specific parts of the body to be protected and for the work to be performed. Refer to U.S. Occupational Safety & Health Administration (OSHA) Regulations (Standards - 29 CFR) Safeguards for personnel protection. - 1910.335, or applicable national, state or local regulations, for additional information.

• Personal protective equipment must be maintained in a safe, reliable condition and periodically inspected or tested.

• Protective shields, protective barriers, or insulating materials must be used to protect each person from shock, burns, or other electrically-related injuries while that person is working near exposed energized parts which might be accidentally contacted or where dangerous electric heating or arcing might occur. When normally enclosed live parts are exposed for maintenance or repair, they must be guarded to protect unqualified persons from contact with the live parts.

• Safety signs and tags. Safety signs, safety symbols, or accident prevention tags must be used where necessary to warn people about electrical hazards which may endanger them.

Conductive Materials and Equipment

Materials and equipment that can conduct electricity must be handled in a way that will prevent them from contacting energized power lines, exposed conductors or circuit parts.

• When handling long conductive objects (such as but not limited to truss rods, pipes, angles and ladders) in areas with energized power lines, exposed conductors or circuit parts, work practices (such as the use of insulation, guarding, and material handling techniques) must be used to minimize the hazard.

• Portable ladders must have non-conductive side rails.

• Do not wear conductive articles of jewelry and clothing (such as but not limited to watch bands, bracelets, rings, key chains, necklaces, metalized aprons, cloth with conductive thread, or metal headgear) that could come in contact with energized power lines, exposed conductors or circuit parts.

Fall Protection

Identify potential fall hazards and determine if fall protection equipment is appropriate for the task, before beginning the work. Pay attention to hazards associated with routine and non-routine tasks. Inspect fall protection equipment (harnesses, lanyards) and devices (guardrails, tie-off points) before each use. Use fall protection equipment if required for the job. Be sure the fall protection equipment is right for the task, fits properly, and is in good condition. Refer to U.S. Occupational Safety & Health Administration (OSHA) Regulations Standards - 29 CFR 1926.500, 1926.501 and 1926.502, or applicable national, state or local regulations for more information.

• When using scaffolds, make sure there is proper access, full planking, stable footing, and guard railing.

• When using a boom lift, keep feet firmly on the platform of a boom lift, use fall protection equipment tied-off at all times to the guardrail or tie-off point.

• When using a ladder, make sure the ladder is non-conductive and the correct size for the task. Read the ladder user instructions and be sure the ladder is in good condition. Make sure ladder is set on stable footing and at the correct angle.

Minimum Working Clearance

To reduce the risk of injury, all persons require adequate working clearance around the electrical panel or other electrical equipment. The table below identifies the minimum working clearance needed. Refer to U.S. Occupational Safety & Health Administration (OSHA) Regulations (Standards - 29 CFR) Safeguards for personnel protection. -1910.303(g)(1)(i), or any other applicable national, state or local regulations, for additional information.

MINIMUM WORKING CLEARANCE 0-600 VOLTS				
WIDTH OF WORKING CLEARANCE AREA	HEIGHT OF WORKING CLEARANCE AREA	★MINIMUM WORKING CLEARANCE IN FRONT OF ELECTRICAL PANEL/EQUIPMENT		
		EXPOSED LIVE PARTS ON ONE SIDE OF WORK SPACE AND NO LIVE GROUNDED PARTS ON THE OTHER SIDE.	EXPOSED LIVE PARTS ON ONE SIDE OF WORK SPACE AND LIVE GROUNDED PARTS ON THE OTHER SIDE.	EXPOSED LIVE PARTS ON ONE SIDE OF WORK SPACE AND EXPOSED LIVE PARTS ON THE OTHER SIDE.
30in.(760mm) MINIMUM OR WIDTH OF ENCLOSURE, WHICH EVER IS GREATER	78in.(1980mm) MINIMUM OR HEIGHT OF ENCLOSURE, WHICH EVER IS GREATER	36in.(915mm) MINIMUM	42in.(1065mm) MINIMUM	48in.(1220mm) MINIMUM

★Concrete, brick or tile walls shall be considered as grounded.

Qualified Person

A Qualified Person is one who, by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training, and experience, has successfully demonstrated his/her ability to solve or resolve problems related to the subject matter, the work, or the project.

Only qualified persons may work on electric circuit parts or equipment that have not been de-energized.

Refer to U.S. Occupational Safety & Health Administration (OSHA) Regulations Standards - 29 CFR 1926.32(m) and 1910.333, or applicable national, state or local regulations for additional information.

Valley GGS Control Panel

Safety
Overhead Power Lines

Assembling, towing or transporting irrigation machine components such as but not limited to the pivot point, linear cart, span/drive unit assemblies, overhangs and/or corner assemblies underneath or near power lines is extremely dangerous because of the risk of electrocution.

Operating equipment that elevates irrigation machine components, such as but not limited to an aerial lift or crane, near power lines is extremely dangerous because of the risk of electrocution. Only qualified personnel should operate this type of equipment. Before operating the equipment, qualified personnel must read the equipment manufacturers' operating and safety instructions.

Refer to U.S. Occupational Safety & Health Administration (OSHA) Regulations (Standards - 29 CFR) Cranes and derricks. - 1926.550, or any other applicable national, state or local regulations for additional information.

- Always presume that any overhead power line is an energized line unless and until the person(s) owning the line and/or the electrical utility authorities indicate that it is not an energized line and it has been visibly grounded.

- Before operating any equipment near any power line make sure the line has been de-energized and visibly grounded at the point of work.

- Electrocution can occur without touching an electrical power line. Electricity, depending on the magnitude, can jump or become induced into equipment or conductive materials that come in close proximity to, but do not touch a power line. High wind, lightning, wet ground and other environmental conditions will increase the possibility of electrocution and require additional consideration.

- Transmitter towers can induce the equipment or materials being handled with an electrical charge. Before working or operating equipment near transmitter towers, make sure the transmitter is de-energized.

- Select the location where the span/drive unit will be assembled to ensure that neither the irrigation machine, or the equipment used during the assembly process, will violate the minimum clearance guidelines.

- Never operate equipment or allow the load, ropes or tag lines within 10 ft (3.05 m) of any power line rated 50 kV or lower whether it is energized or not. For lines rated over 50 kV, the minimum clearance shall be 10 ft (3.05 m) plus 0.4 inch (1.1 cm) for each kV over 50 kVs.

- Never assemble, tow, transport or allow irrigation machine components underneath or within 10 ft (3.05 m) of any power line rated 50 kV or lower whether it is energized or not. For lines rated over 50 kV, the minimum clearance shall be 10 ft (3.05 m) plus 0.4 inch (1.1 cm) for each kV over 50 kVs. Overhang support angles, cables and spinner drive components regularly extend 10 ft to 12 ft (3.1 m to 3.7 m) above the irrigation pipeline (span).

- Use barricades to identify areas where interference with overhead power lines could occur. Keep the assembly, towing or transporting of irrigation machine components and the operation of equipment including load, ropes or tag lines away from any power line, in the distances described above, whether the line is energized or not.

- Always designate a person to observe clearance between the power line and all equipment being operated or moved in order to give timely warning for all operations to STOP if the minimum clearance is violated.

Minimal Lockout / Tagout Procedure

The following procedure establishes the minimum requirements for the lockout of energy isolating devices whenever maintenance or servicing is done on machines or equipment. It is used to ensure that the machine or equipment is stopped, isolated from all potentially hazardous energy sources and locked out before personnel perform any servicing or maintenance where the unexpectedly energized or start-up of the machine or equipment or release of stored energy could cause injury. All personnel, upon observing a machine or piece of equipment which is locked out to perform servicing or maintenance shall not attempt to start, energize, or use that machine or equipment.

When the energy isolating devices are not lockable, tagout should be used and affected personnel must wear full personal protection.

Refer to U.S. Occupational Safety & Health Administration (OSHA) Regulations (Standards - 29 CFR) Typical minimal lockout procedures - 1910.147 App A, or applicable national, state or local regulations, for additional information.

Sequence of Lockout

1. Notify all affected personnel that servicing or maintenance is required on a machine or equipment and that the machine or equipment must be shut down and locked out to perform the servicing or maintenance.

2. The authorized personnel shall identify the type and magnitude of the energy that the machine or equipment utilizes, shall understand the hazards of the energy, and shall know the methods to control the energy.

3. If the machine or equipment is operating, shut it down by the normal stopping procedure (depress the stop button, open switch, close valve, etc.).

4. De-activate the energy isolating device(s) so that the machine or equipment is isolated from the energy source(s).

5. Lock out the energy isolating device(s) with assigned individual lock(s).

6. Stored or residual energy (such as that in capacitors, springs, elevated machine members, rotating flywheels, hydraulic systems, and air, gas, steam, or water pressure, etc.) must be dissipated or restrained by methods such as grounding, repositioning, blocking, bleeding down, etc.

7. Ensure that the equipment is disconnected from the energy source(s) by first checking that no personnel are exposed, then verify the isolation of the equipment by operating the push button or other normal operating control(s) or by testing to make certain the equipment will not operate. CAUTION: Return operating control(s) to neutral or "off" position after verifying the isolation of the equipment.

8. The machine or equipment is now locked out.

⚠ DANGER

- WHEN PERSONNEL WILL BE EXPOSED TO CIRCUIT ELEMENTS AND ELECTRICAL PARTS, A QUALIFIED PERSON MUST USE TEST EQUIPMENT TO VERIFY THAT THE CIRCUIT ELEMENTS AND EQUIPMENT PARTS OF THE EQUIPMENT ARE DE-ENERGIZED.

Restoring Equipment to Service

When the servicing or maintenance is completed and the machine or equipment is ready to return to normal operating condition, the following steps shall be taken:

1. Check the machine or equipment and the immediate area around the machine to ensure that non-essential items are removed and that the machine or equipment components are operationally intact.

2. Check the work area to ensure that all personnel are safely positioned or removed from the area.

3. Verify that the controls are in neutral.

4. Remove the lockout devices and re-energize the machine or equipment.

5. Notify affected personnel that the servicing or maintenance is completed and the machine or equipment is ready to be used.

Valley GGS Control Panel

Safety
Operate Safely

Valley Irrigation machines are designed with safety in mind. However, if this machine is operated incorrectly, it may pose a safety threat to the operator. A good safety program is much like a chain, it is only as strong as its weakest link. The manufacturer, dealer, and operator must maintain and improve all safety programs. Following is a list of safety operating tips which you and all other persons servicing or operating the machine must read and understand:

⚠ CAUTION

- **DO NOT OPERATE THIS MACHINE WITHOUT FIRST READING THE OWNER'S MANUALS FOR THE MACHINE.**

- **READ ALL SAFETY MESSAGES IN THIS MANUAL AND SAFETY SIGNS ON THE MACHINE.**

- **DO NOT LET ANYONE OPERATE THIS MACHINE WITHOUT PROPER INSTRUCTIONS.**

- **UNAUTHORIZED MODIFICATIONS MAY IMPAIR THE FUNCTION AND/OR SAFETY OF THE MACHINE.**

- **IF YOU DO NOT UNDERSTAND ANY PART OF THIS MANUAL, CONTACT YOUR VALLEY DEALER.**

EMPLOYEE INSTRUCTION ON SAFETY

It is very important to instruct your employees on the safe use of this equipment at the time of their initial assignment to operate it. DO NOT let anyone operate this equipment without proper instructions.

Safety training should be presented annually and the service manager should ensure employees fully understand the safety messages and what to do in case of emergencies.

EMERGENCY STOPPING

The machine can be stopped at any time at any tower by turning the disconnect switch, located underneath the tower box, to the OFF position. See figure 12-1.
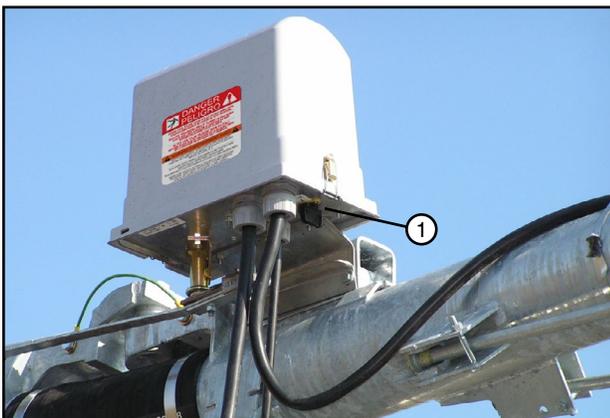

Figure 12-1   1. Disconnect Switch

⚠ DANGER

DISCONNECT POWER WHEN SERVICING

ALWAYS disconnect electrical power before servicing or performing maintenance to the machine.

If you are going to perform maintenance on the machine, **YOU MUST** shut off and lock the main power disconnect as shown below. See figure 12-2.

Figure 12-2   1. Main Power Disconnect
                       2. Lock

The blue (OSHA safety color code) tag shown below should also be filled out and attached to the disconnect after locking. See figure 12-3.

The tag should reveal the name of a person to contact before restoring power to the machine.

Figure 12-3

Operate Safely (Continued)

⚠ CAUTION

QUALIFIED SERVICE PERSONNEL
If you do not understand electricity or other parts of the machine, have qualified service personnel perform any hazardous repairs or maintenance.

⚠ CAUTION

GUARD ALL POWER TAKE-OFF DRIVES
This includes all belt and power line drives.

Replace any guards and shields removed for maintenance.

⚠ WARNING

SUSPECTED SHORT CIRCUITS
DO NOT touch the machine if you suspect a short-circuit situation. Call a qualified electrician or an authorized Valley dealer immediately.

Circumstances which may cause you to suspect hazardous voltage situations may include:

• Physical damage to the machine or span cable.

• Recent electrical storms (lightning).

• Unusual operating characteristics of the machine.

If you suspect a short circuit due to feeling a rippling tingle when touching the machine, **DO NOT** touch the machine again. Call a qualified electrician or an authorized Valley dealer immediately.

⚠ WARNING

LIGHTNING AND THE MACHINE

Stay away from the machine during an electrical storm. An irrigation machine makes a good path to earth. It is also probably the tallest object in the field, which makes it a good lightning receptor!

⚠ CAUTION

DO NOT OVERSIZE FUSES
Fuses are sized for the protection of a specific machine.

Be certain you have the proper fuse sizes in place before initial startup and when replacing fuses.

⚠ CAUTION

PLUG - IN CONNECTORS
Disconnect power before connecting or disconnecting any plug-in connectors.

⚠ DANGER

DRIVE SHAFTS START WITHOUT WARNING
An electric motor on each tower of the center pivot powers two drive shafts connected to wheel gear drives. These drive shafts start and stop without warning.

• DO NOT touch rotating drive shalt or shield, clothing or limbs may become entangled, resulting in severe injury.

• DO NOT service the machine until the main disconnect is locked in the OFF position.

• ALWAYS replace drive shaft shields after servicing.

• DRIVE SHAFT SHIELDS MUST ALWAYS BE IN PLACE WHEN OPERATING THE MACHINE.

⚠ CAUTION

CHECK WHEEL TRACKS BEFORE STARTING

Make sure all objects, livestock, or persons are clear of the machine before starting. Drive trains are powerful and can climb over vehicles, equipment, etc.

⚠ CAUTION

KEEP CHILDREN AWAY

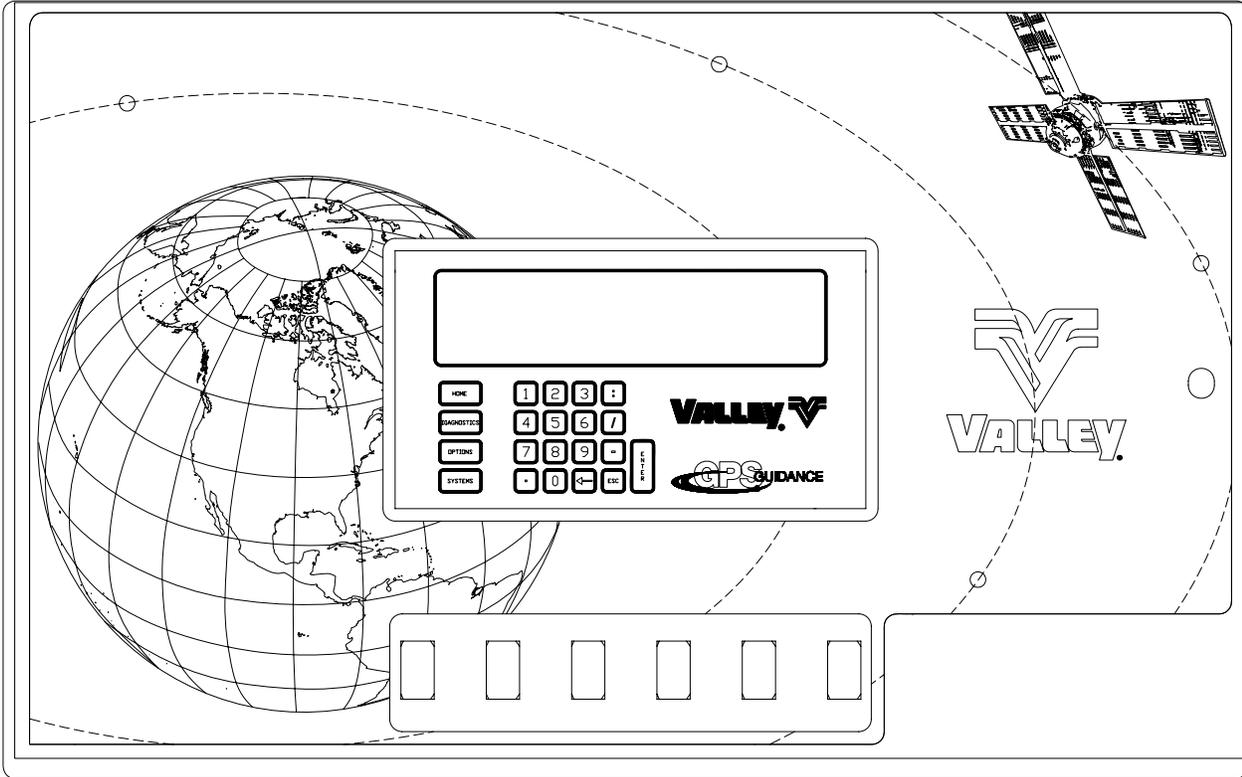Irrigation machines are NOT playground equipment.

Prevent children from playing or climbing around on the machine. This can be extremely dangerous, especially if the machine is operating.

Valley GGS Control Panel

Safety
Safety Decals

These Danger, Warning, and Caution decals appear in various locations on a Valley irrigation machine. You MUST familiarize yourself and other operator's with these safety decals. For replacement of any decal, contact your local Valley dealer.

0999122

Safety Decals (Continued)

⚠ WARNING

Improper installation of this motor may result in fire, explosion, electrical shock or other personal injuries. Read operating instructions

Disconnect power before maintenance. Open all circuits before removing conduit box cover. Be sure motor is properly grounded per local and national codes.

Do not place fingers or objects near openings.

Do not use eye bolts or lifting hooks to lift anything except the product.

NOT OFFERED

⚠ DANGER ⚠

Drive Shaft Starts Without Warning!
- Do not touch rotating drive shaft or shield. Clothing or limbs may become entangled, resulting in severe injury.
- Do not service until machine is locked in the off position.
- Always replace drive shaft shield after servicing.

0994146

Valley GGS Control Panel

Safety

Operation

Starting the GGS Control Panel

Power to the GGS control panel is provided by the machine control panel on a linear machine and by the machine control panel through the swing tower box on a corner machine.

Linear Applications

The GGS control panel is also ON when power is supplied to the machine and the machine control panel disconnect is ON.

Corner Applications

The GGS control panel is also ON when the following conditions are met:
- Power is supplied to the machine.
- The machine control panel disconnect is ON.
- The swing tower box disconnect is ON.
- The machine is in service mode or started or running.

Machine Startup

Very little additional effort is necessary when starting a machine with a GPS Guidance System. Whatever procedure was used to start the machine before the GPS Guidance System was installed is the same procedure you use when starting the machine now.

The GPS Guidance System has an extensive boot sequence which can take up to 30 minutes, though the usual startup time is about 5 minutes.

If power to the machine is applied and "Start" is pressed directly afterward, the machine waits until the GPS Guidance Panel successfully completes the boot sequence and displays "READY TO GUIDE", "GUIDING FORWARD", or "GUIDING REVERSE" in the Status screen before beginning to move automatically on the designated course. No other involvement is necessary.

- The GPS Panel will display "READY TO GUIDE", "GUIDING FORWARD", or "GUIDING REVERSE" before the machine moves.

- The GPS Guidance System does not reverse the direction of the machine automatically when the end of the field is reached, so it is very important not to remove the existing auto-reverse mechanism.

GPS Boot Sequence Display Screens

Boot Splash Screen

Figure 17-1 shows the splash screen that appears while the GPS Guidance System is booting up.
- mm/dd/yy – the month, day, and year of the software release

- Ver x.xx – the software version number
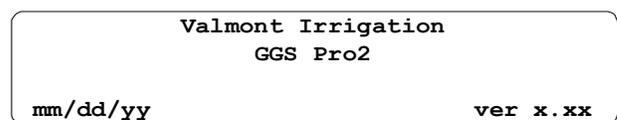
```
        Valmont Irrigation
             GGS Pro2

 mm/dd/yy                      ver x.xx
```
Figure 17-1

GGS Computer Boot Up Screen

Figure 17-2 shows the screen that appears while the system waits for the GGS computer to boot up.

The remaining wait time is displayed in minutes:seconds format. If the timer times out before the system gets a response from the GGS computer, the system will open the safety and keep it open until the GGS computer is rebooted or communications is established with the GGS computer.

```
      NAVIGATION COMPUTER START UP
    (THIS MAY TAKE UP TO 5 MINUTES)
               mm:ss
```
Figure 17-2
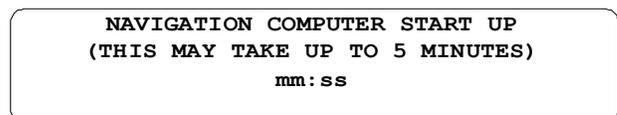
Valley GGS Control Panel

Operation
GPS Boot Sequence Display Screens
Acquiring Satellites Screen

Figure 18-1 shows the screen that appears while the system waits for the GPS Receiver to acquire signals from the satellites.

The mm:ss field displays how much time (minutes:seconds) has passed while waiting for sufficient signal information from the GPS Receiver. If the time expires and the GGS Computer has yet to receive sufficient signal information from the GPS Receiver, the system will open the safety for ten seconds.

The system displays the message shown in Figure 18-1 until the GPS Receiver finishes acquiring the signals from the satellites.

Establishing Accurate Position Screen

Figure 18-2 shows the screen that appears while the GGS System is establishing an accurate position to guide the system.

The mm:ss field displays the amount of time (minutes:seconds) that passes while the GGS Computer waits to receive an accurate signal. If 20 minutes pass and the GGS Computer has yet to receive an accurate signal, the system will open the safety for ten seconds.

Position Uncertainty = x.xxx M (9.999 maximum).

Position Uncertainty represents the machine position as being within a radius of the value shown. This number is supplied by the GGS Computer.

RTK LINK = xxxx – The current status of the Rover GPS RTK correction link. NONE is displayed when there is no link and OK is displayed when the link is OK.

Establishing an accurate position would include, but not be limited to the RTK GPS Reference Station acquiring sufficient corrected satellites and the Rover GPS Receiver establishing a link and getting correction data from the RTK GPS Reference Station. See Figure 18-3.

The GGS Computer waits for the Position Uncertainty to be less than 0.04 M (4 cm) before allowing the machine to move.

```
        ACQUIRING GPS SIGNAL
   (THIS MAY TAKE UP TO 20 MINUTES)
              mm:ss
```
Figure 18-1

```
     ESTABLISHING ACCURATE POSITION
        POSITION UNCERTAINTY = x.xxx M
   RTK LINK = xxxx    SATS IN VIEW = xx
    mm:ss (THIS MAY TAKE UP TO 20 MIN)
```
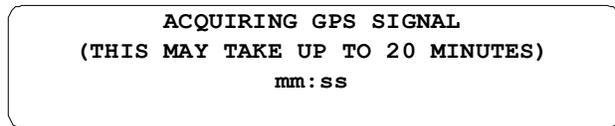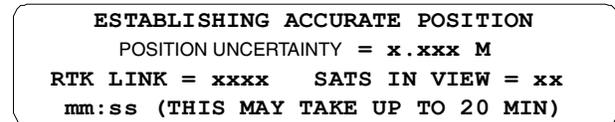Figure 18-2
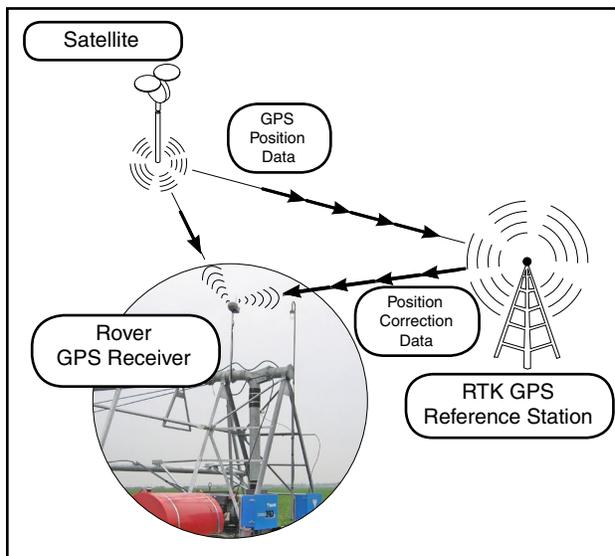
Figure 18-3

Overview

This section briefly describes of the Valley GPS Guidance System (GGS) Control Panel components and controls.

GGS Control Panel

Linear Applications

When the GGS control panel is used with a linear machine the GGS control panel is mounted near the Machine control panel and a GPS receiver is mounted above the cart. See Figures 19-1 and 19-2.
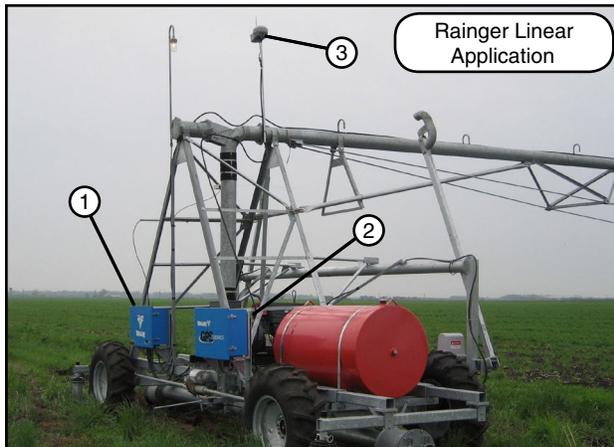
Figure 19-1   1. Machine Control Panel
2. GGS Control Panel
3. GPS Receiver
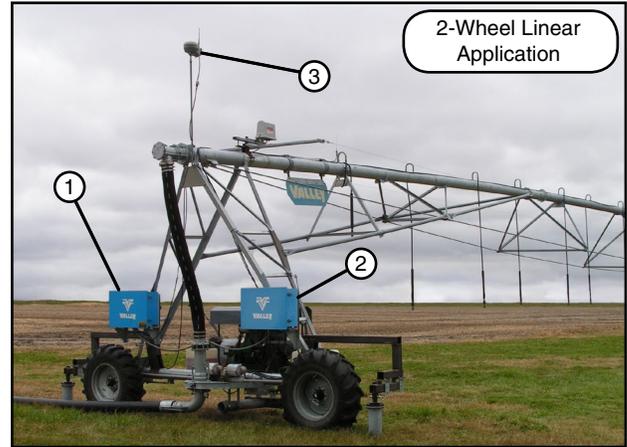
Figure 19-2   1. Machine Control Panel
2. GGS Control Panel
3. GPS Receiver

Corner Applications

When the GGS control panel is used with a Precision or Global corner the GGS control panel is mounted on the Steerable Drive Unit (SDU) above the swing tower box. On a Mechanical corner the GGS control panel is mounted on the Steerable Drive Unit (SDU) leg. The GPS receiver is mounted on the overhang sign support above the SDU. See Figures 19-3 and 19-4.

Figure 19-3   1. GGS Control Panel
2. Swing Tower Box
3. GPS Receiver

Figure 19-4   1. GGS Control Panel
2. Swing Tower Box
3. GPS Receiver

Valley GGS Control Panel

Overview
Control Panel Display - Items 1 and 2

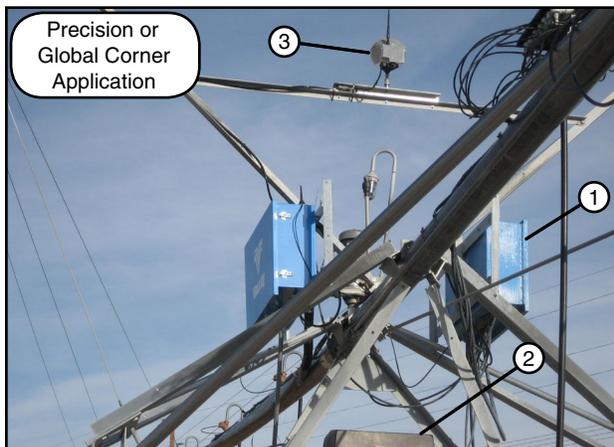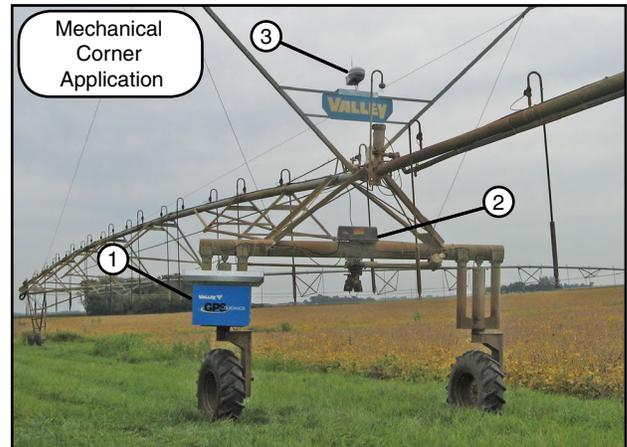The control panel display is used to show current machine status and information for programming and selecting functions. When the control panel main disconnect is turned on and at all other times when the operator is not programming the control panel, the control panel display shows the current machine status on the status screen. See Figure 20-1. A short explanation of the status screen elements is given below and on the following pages.
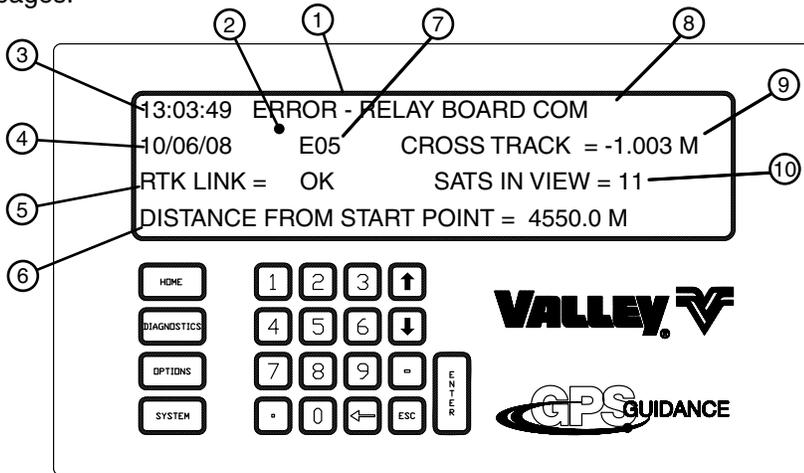

Figure 20-1
1. Control Panel Display
2. Default Status Screen
3. Time
4. Date
5. RTK Link Status
6. Distance From Start Point
7. Error Code
8. Current Status
9. Cross Track
10. Sats in View

NOTE

• **This Status Screen example illustrates the operating conditions of a typical irrigation machine. The Status screen of your machine will show different conditions.**

Time - Item 3

Displays the current time according to the clock in the GGS computer.

If the current time is 1:45:00 P.M., it appears on the screen in the 24-hour format as 13:45:00. See Figure 20-1.

Date - Item 4

Displays the current date according to the clock in the GGS computer.

If the current date is August 18, 2007, it appears on the screen as 08/18/07. See Figure 20-1.

RTK Link Status - Item 5

Displays the current status of the Rover GPS RTK radio link to the RTK Reference Station. NONE appears on the screen when no link exists, and OK appears when the link is OK. See Figure 20-1.

Distance From Start Point - Item 6

Displays the current distance, in meters, that the irrigation system is from the path start point. See Figure 20-1.

Error Code (Exx) - Item 7

This field displays any errors that occurred and were not acknowledged by viewing them in the Diagnostics Screen (see Section 3). Exx appears only when a system error has occurred. The error codes will cycle once every two seconds. Error codes E01-E12 may also appear. See Figure 20-1.

Current Status - Item 8

Displays a message indicating the current status of the GGS system. See Figure 20-1.

Cross Track - Item 9

Displays the lateral distance of the irrigation system from the stored path in meters. When facing the direction of travel, left of the stored path is a positive number and right is a negative number. See Figure 20-1.

Sats in View - Item 10

The current number of corrected satellites the GPS Rover is using for navigation. See Figure 20-1.

Valley GGS Control Panel

Function Keys

The function keys are located on the far left side of the keypad. See Figure 21-1.

The function keys are used to program the panel, view data and select options not frequently used. Following are explanations of each function key.
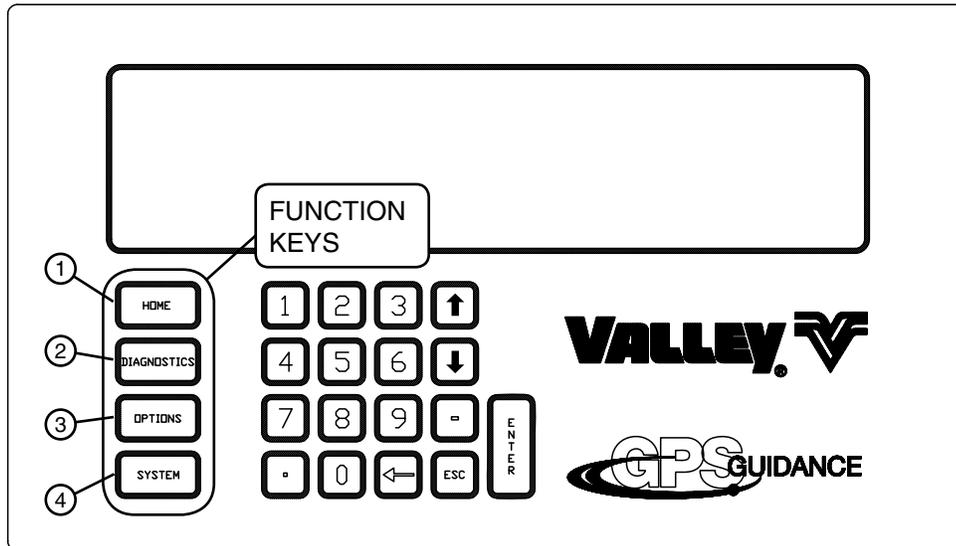
Figure 21-1   1. Home Key   3. Options Key
                   2. Diagnostics Key   4. System Key

Home Key - Item 1

Press this key to return to the Status screen from the screen you are currently on. See Figure 21-1.

Options Key - Item 3

This key has no current function. See Figure 21-1.

Diagnostics Key - Item 2

Press this key to determine the cause of an unplanned machine shutdown or potential problem situation. See Figure 21-1.
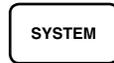
System Key - Item 4

Press this key to view machine operating data. See Figure 21-1.

Valley GGS Control Panel

Overview
Numeric Entry Keys

The numeric entry keypad is used to input values such as percentage timer setting, water application depth, SIS setting, etc. and is also used for programming the panel. The functions of these keys are explained below:
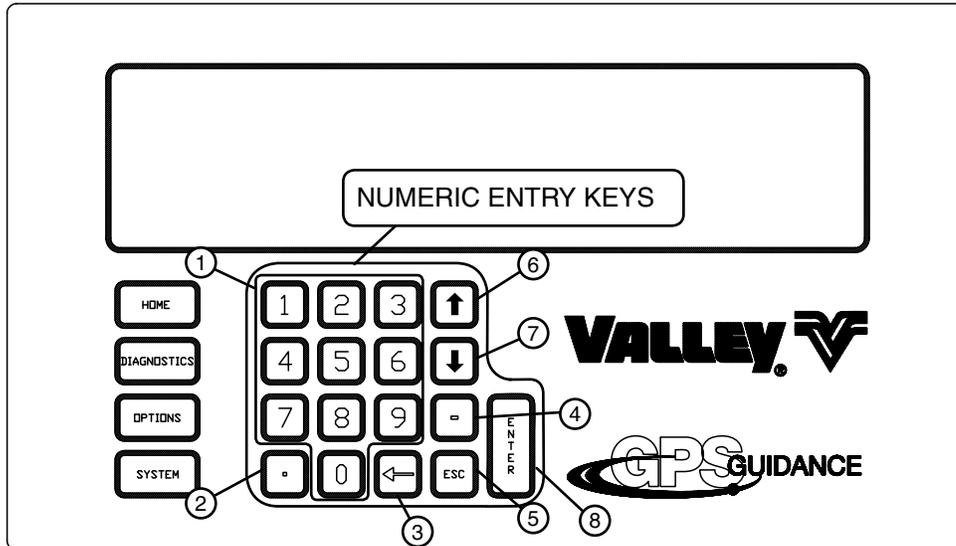
Figure 22-1

1. Number Keys
2. Decimal Point Key
3. Back Arrow Key
4. Minus Sign Key
5. Escape Key
6. Higher Contrast Key
7. Lower Contrast Key
8. Enter Key
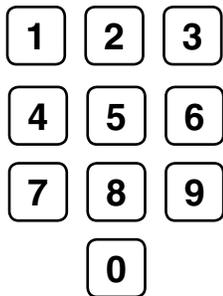
Number Keys - Item 1
Use these keys to select a menu option. See Figure 22-1.

Decimal Point Key - Item 2
Use to input numerical values in decimal form. See Figure 22-1.

Example: 1.75 inches (44.45 mm).

Back Arrow Key - Item 3
Press this key to clear the error code. See Figure 22-1.

Minus Sign Key - Item 4
Use to input negative values (generally not used). See Figure 22-1.

Escape Key - Item 5
Use to step backward from the current screen to a previous screen without performing any changes. See Figure 22-1.

Repeatedly pressing the Escape key will step backward from the current screen, through previous screens until the Status screen is displayed.

Higher Contrast Key - Item 6
Press this key to increase contrast or make the characters darker. See Figure 22-1.

Lower Contrast Key - Item 7
Press this key to decrease contrast or make the characters lighter. See Figure 22-1.

Enter Key - Item 8
Use at the end of a numerical value entry or programming sequence. See Figure 22-1.

Symbols and Conventions

This manual uses a few symbols and conventions which are explained below:

Command Prompt

Any command which requires the operator to input data will show a command prompt on the bottom line of the screen.

The command prompt is always identified by > in the bottom line of the screen. See figure 23-1.

Exiting Screens

Press ⓪ or (ESC) one time to step backward from the current screen to the previous screen.

Press ⓪ or (ESC) repeatedly to step backward from the current screen, through previous screens until the Status screen is displayed.

Screen Delays

Any screen that is left for more than five minutes without pressing a key will revert back to the previously displayed screen. The Status screen will eventually be displayed.

Illustrations

The descriptions of procedures throughout this manual consist of instructions illustrating the key or series of keys to press followed by the screen that appears. This convention is used throughout the manual. Below is an example.

Press (SYSTEM), ②, and ① to access the A/D screen. See Figure 23-2.

```
0 EXIT              3 COM PORT
1 TIME              4 GGS CONFIG
2 DATE
CURRENT DATE (XX / XX / XX) >
```
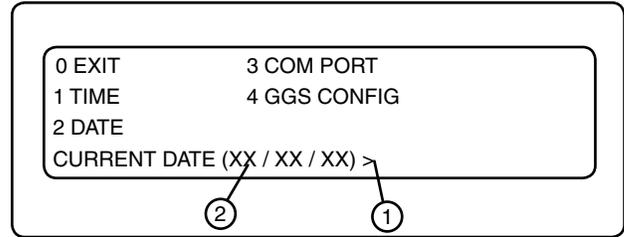
Figure 23-1   1. Command Prompt
               2. Default Value

NOTE

• The value shown in parenthesis indicates the current value being used by the control module.

```
0 EXIT
1
2 DATA
PRESS NUMBER > 2
```

```
0 EXIT              3 NAVIGATION
1 A/D
2 MODULES
PRESS NUMBER > 1
```

0	42	3	1065	6	1234	9	2341
1	709	4	2481	7	0	10	9
2	779	5	2568	8	3698	11	0
PRESS ANY KEY >							

Figure 23-2

Valley GGS Control Panel

Overview

Troubleshooting

Use this section with the machine owner's manual to diagnose and troubleshoot problems with the machine and/or control panel. Keep in mind the following precautions:

- Always perform service or maintenance safely.

- Use personal protection equipment when required.

- Maintain a minimum working clearance around the control panel and other equipment.

- Use fall protection when required.

- Always use at least the minimal lockout/tagout procedure when maintaining or servicing the machine.

For more information see the Safety section.

⚠ WARNING

•**TO REDUCE THE POSSIBILITY OF SEVERE INJURY OR DEATH:**

•**TROUBLESHOOTING OR REPAIRING ELECTRICAL PROBLEMS SHOULD ONLY BE PERFORMED BY A QUALIFIED VALLEY DEALER.**

•**ALWAYS CONTACT YOUR LOCAL VALLEY DEALER TO TROUBLESHOOT OR CORRECT ANY ELECTRICAL PROBLEMS ON OR ASSOCIATED WITH THE CONTROL PANEL OR MACHINE.**

•**NEVER ATTEMPT TO TROUBLESHOOT OR CORRECT ELECTRICAL PROBLEMS ON YOUR OWN.**

•**USE PERSONAL PROTECTION EQUIPMENT WHEN REQUIRED.**

•**MAINTAIN A MINIMUM WORKING DISTANCE AROUND THE CONTROL PANEL AND OTHER EQUIPMENT.**

•**USE FALL PROTECTION WHEN REQUIRED.**

•**BEFORE SERVICING OR PERFORMING MAINTENANCE ON THE MACHINE, ALWAYS SHUT OFF ALL ELECTRICAL POWER TO THE CONTROL PANEL AND MACHINE, THEN USE THE MINIMAL LOCKOUT/TAGOUT PROCEDURE ON THE SERVICE DISCONNECT AND CONTROL PANEL.**

Valley GGS Control Panel

Troubleshooting
System Faults

Figure 26-1 is a table that lists and describes possible system faults, possible cause(s), whether the machine shuts down when the error occurs, and corrective action(s) to take.

SYSTEM FAULT	DESCRIPTION WITH POSSIBLE CAUSES	SHUT DOWN	CORRECTIVE ACTION
RELAY COM FAULT	There is a hardware or software communication problem between the Control Panel Module and the Electrical Relay Board within the Control Panel. Communication between the Control Panel Module and Relay Board is lost for more than one second.	YES	Contact your Valley dealer.
FAULT – GGS POWER	The GGS Computer is receiving insufficient power.	YES	Contact your Valley dealer.
FAULT – GGS COM	Communication between the Control Panel Module and GGS Computer is lost.	YES	Contact your Valley dealer.
FAULT – GGS TIMEOUT	The GGS Computer had an error that lasted more than 20 minutes. This is typically due to the GPS Rover not having a clear view of the sky, which results in a low satellite count (less than five). Another cause could be a satellite trough, which occurs when the geometry of the satellites is such that fewer than five visible satellites are at least ten degrees above the horizon.	YES	Remove any GPS Rover obstruction in order to give the Rover a wider view of the sky. For a satellite trough, the only option is to wait about 45 minutes for the trough to pass.
FAULT – GGS GUIDANCE	This is typically due to a machine driving off the path by a distance that is larger than the safety band (Corner +/- 2 meters, Linear +/- 1 meter).	YES	Determine why the machine is off the path, correct it, and then control it manually to get it closer to the path. Once it is within the safety band, let it guide itself back onto the path.
FAULT – RTK REF COM	The GPS Rover is not receiving corrections from the GPS Reference Station.	YES	Make sure the "rubber ducky" antenna on the GPS Rover is not missing or damaged, and that a line of sight to the GPS Reference Station exists.
GPS COM FAULT	The GGS Computer is not receiving location information from the GPS Receiver on the Linear Cart. While system was running or waiting, all of the following must have occurred: 1. GPS is selected as a protocol. 2. GPS signal loss is set to shut down the machine. 3. The machine shut down is due to no communication with the GPS for a user specified time.	YES	Check the GPS connection and the power. Contact your Valley dealer.
GPS SIGNAL FAULT	The GPS signal is of insufficient quality for guiding the system. While system was running or waiting, all of the following must have occurred: 1. GPS is selected as a protocol. 2. GPS signal loss is set to shut down the machine. 3. The machine shut down due to GPS signal loss for a user specified time.	YES	Check for a clear path above the antenna. Contact your Valley dealer.

Figure 26-1

Troubleshooting

Error Codes

The following table lists all the possible error codes, with their descriptions, the threshold for the error to occur, whether the machine shuts down due to the error, and possible causes or corrective actions to take. See Figure 27-1 below and Figure 32-1 on the next page.

ERROR	DESCRIPTION	THRESHOLD	SYSTEM FAULT SHUT DOWN	POSSIBLE CAUSES or CORRECTIVE ACTION	SHOWN ON SCREEN
E01	BATTERY BACKED RAM – CHECKSUM FAILED AT POWER UP.		YES	CheckSum incorrect in BBRAM section of memory.	YES
				Weak batteries in Real-time Clock (BBRAM) can cause error. The batteries can last up to 10 years. Replace Real-time Clock if this error occurs.	
				Contact your Valley dealer	
E02	EEPROM – CHECKSUM FAILED AT POWER UP.	One of the blocks failed.	YES	CheckSum incorrect in EEPROM section of memory.	YES
				Error can occur when power is lost while entering constants, which can also result in loss of data.	
				Try to Hard Reset Module.	
				Contact your Valley dealer.	
E03	UNIT RESETS – THIS IS LOGGED WHEN THE SOFTWARE RESETS		NO	Records software resets caused by power cycles or electrical switching noise that disturbs the computer processor.	NO
E04	KEYPAD – POSSIBLE KEY STUCK, CHECK KEYPAD CONNECTION	10 minutes	YES	Keypad failure or key stuck. A key that is logged as stuck is ignored until the power is cycled on the Control Panel Module.	YES
				Contact your Valley dealer.	
E05	RELAY BOARD COMMUNICA-TIONS ERROR, CHECK RELAY BOARD CABLE CONNECTIONS	1 second	YES	Communications with the relay board is lost.	YES
				Contact Your Valley Dealer.	
E06	GGS POWER OUT OF RANGE – CHECK GGS POWER SUPPLY OUTPUT AND CONNECTIONS	Less than 10 or more than 14 volts.	YES	The power supply is insufficient for proper operation of the Guidance Computer and the GPS Receiver. If the problem persists, contact your Valley dealer.	YES
E07	GGS POWER CYCLES – THIS IS LOGGED WHEN THE GGS POWER IS CYCLED		NO	This error is logged when the GGS Computer is restarted. The GGS Computer will usually restart after it temporarily loses communication with the Control Panel Module. It will also restart when the power supply returns within the correct range of 10 to 14 volts.	NO
				Contact your Valley dealer.	
E08	GGS COMMUNICATIONS ERROR, CHECK GGS POWER AND SERIAL CABLE CONNECTIONS	No GGS to Pro2 communication for at least 2 seconds.	NO	This error is logged when the GGS Computer has not sent information to the Control Panel Module for at least 2 seconds. Possible causes include a bad power or communications cable or a problem with the software running on the GGS Computer.	NO
				Contact your Valley dealer.	
E09	GPS COMMUNICATIONS ERROR, CHECK GPS POWER, SERIAL CABLE, AND CLEAR SKY VIEW	No GPS communication for at least 20 minutes.	NO.	No communication from the GPS Receiver to the GGS Computer occurred for at least 20 minutes. This could be due to a disconnected or damaged GPS Receiver cable or the GPS Receiver not having a clear view of the sky.	NO
				Contact your Valley dealer.	

Figure 27-1

Valley GGS Control Panel

Troubleshooting
Error Codes (continued)

ERROR	DESCRIPTION	THRESHOLD	SYSTEM FAULT SHUT DOWN	POSSIBLE CAUSES or CORRECTIVE ACTION	SHOWN ON SCREEN
E10	RTK REFERENCE COMMU-NICATIONS ERROR, CHECK RTK REFERENCE POWER, SKY VIEW, AND RADIO LINK	60 seconds	NO.	The Rover Receiver has yet to receive an RTK correction from the RTK Reference Station for at least 60 seconds. This could be due to the RTK Reference Station not having power. Also, check the antennas on the Rover and Reference Station and line-of-sight visibility between the two. Another cause could be the RTK Reference Station not having a clear view of the sky.	NO
E11	GPS SIGNAL ERROR, CHECK GPS CLEAR SKY VIEW	60 seconds	NO	The Rover Receiver has an inadequate signal from the satellites and/or information from the RTK Reference Station for computing a position that is accurate enough from which to guide. Causes include the Rover not having a clear view of the sky or not being able to compute a location from at least 5 RTK-corrected satellites (possibly a satellite trough). To check satellite availability in your area, go to http://navcomtech.com/Support/Tools/satellitepredictor/main.cfm.	NO
				Contact your Valley dealer.	
E12	GGS GUIDANCE ERROR, CHECK PATH TRACKING AND MACHINE POSITION TO PATH	Linear 1 meter, Corner 2 meters	YES	The GPS was unable to guide the machine and stay within the safety band (Corner +/- 2 meters, Linear +/- 1 meter).	YES
				Contact your Valley dealer.	

Figure 28-1

Troubleshooting List

The following table shows the various problems with the description, possible causes or corrective action to take. See Figure 28-2 below.

PROBLEM	POSSIBLE CAUSE OR CORRECTIVE ACTION
Backlight does not turn on.	Contact your Valley dealer.
Backlighting does not turn off.	Contact your Valley dealer.
No display	The adjusted contrast is too light or too dark.
	The Disconnect switch is off.
	No power is going to the pivot.
	Contact your Valley dealer.
Screen cycles on and off.	Erratic incoming power
	Low voltage
	Contact your Valley dealer.
Screen is dark.	The contrast is set too high or too low.
	Contact your Valley dealer.

Figure 28-2

Valley GGS Control Panel

Troubleshooting

Hard Reset

A Hard Reset has the following effects to the Electrically Erasable Programmable Read-Only Memory (EEPROM).

- Resets Current Status to factory settings.

- Clears Review history.

- Clears Error Log history.

Executing A Hard Reset

Below are the steps for executing a hard reset:

1. Turn the control panel disconnect to OFF.

2. While turning the control panel disconnect ON, press and hold the Escape key (ESC) until the Reset screen appears. See Figure 29-1.

3. Press one of the following keys:

1 = Reset

2 = Skip the reset function.

If no selection is made within 60 seconds, the reset function skips.

System Screen

From the System screen, you can change settings or view information at anytime. Only the Data function is currently accessible from the System screen.

Press the (SYSTEM) to display the System screen. See Figure 29-2.

Data

Data is used to review machine information collected by the control panel. The following data types are currently available:

- A/D - Review analog voltages for troubleshooting.

- Modules - Review the status of selected relays. A relay is considered a module.

- Navigation - Review a machine's current location and heading.

Data Screen

From the System screen, press 2 to display the Data screen. See Figure 29-3.

A/D - Analog to Digital Voltages

A/D is used to review analog voltages. There are twelve analog channels (0 through 11) available for monitoring voltage feedback. Below is a description of each channel.

- Channels 0 and 1 are not used currently, so ignore any random values that might appear.

- Channel 2 monitors the 12VDC supply for the GGS Computer and the GPS Receiver. This voltage is calculated by dividing the 12VDC supply by 4.3, with the result displayed in millivolts. A valid range for this input is between 2325 to 3255mV.

- Channel 3 monitors the voltage from the Steer Wheel Angle Sensor. This voltage is displayed in millivolts and has a range between 0 and 5000mV as the steered wheels turn in the clockwise direction.

```
RESET EEPROM TO FACTORY DEFAULTS?


PRESS 1..RESET   2..SKIP  >
```
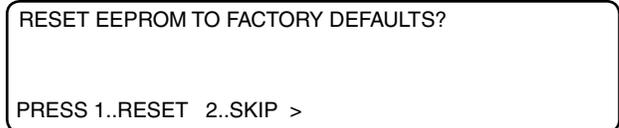Figure 29-1

```
0 EXIT
1
2 DATA
PRESS NUMBER >
```
Figure 29-2   System Screen

```
0 EXIT                  3 NAVIGATION
1 A/D
2 MODULES
PRESS NUMBER >
```
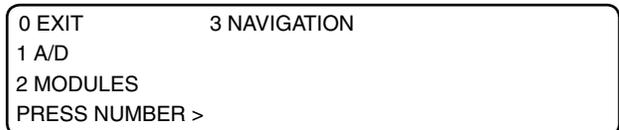Figure 29-3   Data Screen

Valley GGS Control Panel

Troubleshooting
A/D - Analog to Digital Voltages (continued)

- Channel 4 is not used currently, so ignore any random values that might appear.

- Channel 5 monitors the 5VDC supply voltage to the Steer Wheel Angle Sensor. This voltage is calculated by dividing the 5VDC supply by 2. The software uses this result to calculate a ratiometric position for the Steer Wheel Angle Sensor.

- Channels 6 through 11 are not used currently, so ignore any random values that might appear.

Reviewing A/D

To review analog voltages, start from the Status screen and press [SYSTEM], [2], and [1] to display the A/D screen. See Figure 30-1.

Press any key to exit this screen.

Modules

Module is another name for a relay. The machine is monitored and controlled by a series of relays located in the control panel. Each relay will be closed (ON) or open (OFF) as the machine is operating.

Enter a module number in the Review Modules screen and the module number and it's status appear in the upper right-hand corner of the Modules screen.

A list of the module numbers and their corresponding relays is shown in Figure 30-2.

Reviewing Modules

To review module relays, do the following:

1. From the Status screen, press [SYSTEM], [2], and [2] to display the Modules screen.

2. From the Modules screen, press [1] to display the Modules Request screen. See Figure 30-3.

3. From the Modules Request screen, press the desired module number and [ENTER] to display the selected module ("22" in this example) in the upper right-hand corner. See Figures 30-4 and 30-5.

4. Repeat steps 2 and 3 to display other module relays or press [0] to exit this screen.

```
0   42        3 1065       6 1234       9  2341
1   709       4 2481       7   0        10    9
2   779       5 2568       8 3698       11    0
PRESS ANY KEY   >
```
Figure 30-1

MODULE NUMBER	RELAY NUMBER	FUNCTION DESCRIPTION	RELAY BOARD TERMINAL
0	K1	Safety Out	J5-1
1	K2	LRDU Enable	J5-2
5	K9	12VDC for GGS Computer and GPS	J6-1, 2, 3
6	K12	Steer In Output	J7-1, 2
7	K13	Steer Out Output	J7-3, 4
19	K15	Reverse Sense	J7-7, 8
20	K14	Steer Enable Input	J7-5, 6
23	K5	Safety Input Sense	J5-7

Figure 30-2

```
0 EXIT                       MODULE    0   OFF
1 MODULE

PRESS NUMBER  >  1
```
Figure 30-3

```
0 EXIT                       MODULE    0   OFF
1 MODULE

ENTER MODULE NUMBER  >  22
```
Figure 30-4

```
0 EXIT                       MODULE   22   ON
1 MODULE

PRESS NUMBER  >
```
Figure 30-5

Valley GGS Control Panel

Navigation

The Navigation screens inform you of the machine's current position and how far it has deviated from its intended path. This read-only information is in degrees and meters. You can not adjust a machine's path with these screens.

Navigation Screen

From the Status screen, press [SYSTEM], [2], and [3] to display the Navigation screen. See Figure 31-1.

Position Screen

The Position screen shows the current location of the machine in terms of latitude (LAT), longitude (LON), and altitude (ALT). It also shows where the machine is currently heading (HDG).

Press [1] on the Navigation screen to access the Position screen. See Figure 31-2.

Press any key to exit this screen.

Uncertainty Screen

The Uncertainty screen shows the guidance systems calculation of Position and Heading Uncertainty. See Figure 31-3.

wIf an uncertainty value increases beyond the set parameter, the machine movement becomes more restricted. Below are the uncertainty parameters and movement restrictions for each machine type.

Corner:

- A Position Uncertainty greater than .04 meters (4 cm) causes the machine to stop moving.

- A Heading Uncertainty greater than 5 degrees causes the machine to move without further steering.

Linear:

- A Position Uncertainty greater than 0.04 meters (4 cm) causes the machine to stop moving.

- A Heading Uncertainty greater than 2 degrees causes the machine to move without further steering.

Press [2] on the Navigation screen to access the Uncertainty screen. See Figure 31-4.

Press any key to exit this screen.

```
0 EXIT                    3 PATH TRACKING
1 POSITION
2 UNCERTAINTY
PRESS NUMBER >
```

Figure 31-1

```
LAT:    41.3127771 DEG        ALT:   234.56  M
LON:   -96.3461353 DEG        HDG:  213.54 DEG

PRESS ANY KEY >
```
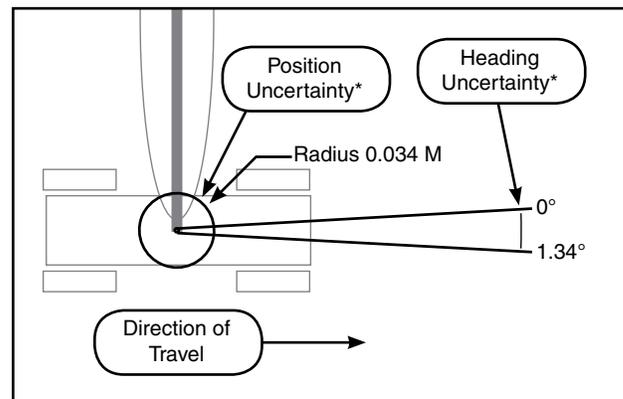
Figure 31-2

Figure 31-3   Linear Application Shown
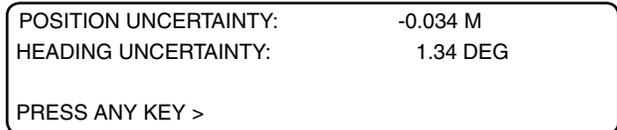* For clarity, the illustrated size of each uncertainty is shown larger than the actual value.

```
POSITION UNCERTAINTY:              -0.034 M
HEADING UNCERTAINTY:               1.34 DEG

PRESS ANY KEY >
```

Figure 31-4

Valley GGS Control Panel

Troubleshooting
Navigation (continued)
Path Tracking Screen

The Path Tracking screen shows how much the machine has deviated from its intended path and direction. The machine uses this data to calculate the projected cross track. If it is greater than 0.0834 meters (8.34 cm), the machine steers automatically. Below is a description of how the projected cross track is calculated for each machine type:

• Because a Corner machine projects 2 meters ahead, the Heading is multiplied by 0.0349 meters. From that result, the Cross track is subtracted.

• Because a Linear machine projects 4 meters ahead, the Heading is multiplied by 0.0698 meters. From that result, the Cross track is subtracted.

Press ③ on the Navigation screen to access the Path Tracking screen. See Figure 32-1.

Press any key to exit this screen.

CROSS TRACK:	-0.023 M
HEADING:	-2.41 DEG
PRESS ANY KEY >	

Figure 32-1

Diagnostics

Diagnostics Screen

The Diagnostics section provides an overview of using the diagnostic features incorporated into the Control Panel. Diagnostics aid in identifying machine failures, troubleshooting, and correcting problems.

Press the Diagnostics button [DIAGNOSTICS] to view the Diagnostics Screen. See figure 33-1.

```
0 EXIT
1 SYSTEM FAULTS              3 SYSTEM REVIEW LOG
2 ERROR LOG
PRESS NUMBER >
```

Figure 33-1

System Faults

System Faults are failures that shut the machine down. Any item showing FAULT on the System Fault screen is the reason why the machine had shut down.

The faults that the System Fault Screen can display are shown below in figure 33-2, along with a brief description. See the Troubleshooting section for possible causes and corrective action.

FAULT – RELAY COM	Communication between the Control Panel Module and relay board is lost for more than one second.
FAULT – GGS POWER	The GGS Computer is receiving insufficient power.
FAULT – GGS COM	Communication between the Control Panel Module and GGS Computer is lost.
FAULT – GGS TIMEOUT	The GGS Computer is not receiving location information from the GPS receiver.
FAULT – GGS GUIDANCE	The GGS Computer has determined that a fault exists in the system.
FAULT – RTKREF COM	The receiver is not receiving RTK correction signals from the RTK Reference Station.
FAULT – GPS SIGNAL	The GPS signal is of insufficient quality for guiding the system.
FAULT – GPS COM	The GGS Computer is not receiving location information from the GPS Receiver.

Figure 33-2

Viewing System Faults

Press the Diagnostics button [DIAGNOSTICS] and then [1] to display the System Faults screen. When a recognized fault causes the machine to shut down, FAULT appears next to the item responsible for the shut down. FAULT is automatically cleared the next time the machine runs successfully. See figure 33-3.
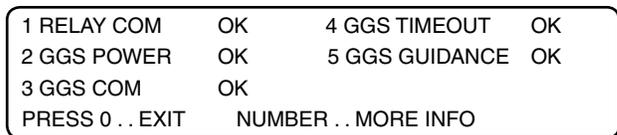
```
1 RELAY COM      OK        4 GGS TIMEOUT    OK
2 GGS POWER      OK        5 GGS GUIDANCE   OK
3 GGS COM        OK
PRESS 0 . . EXIT       NUMBER . . MORE INFO
```

Figure 33-3

Status Screen Diagnostics

If a failure occurs, an error code appears on the Main Display screen. If multiple errors have occurred, those errors will appear in a sequence every second. Only error codes 1, 2, 4, 5, 6 and 12 appear. See figure 33-4.
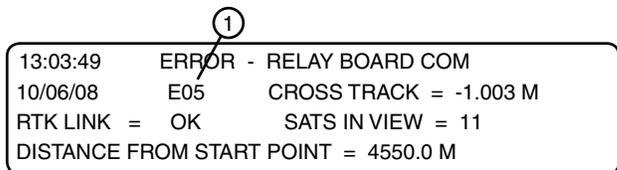
```
13:03:49        ERROR  -  RELAY BOARD COM
10/06/08        E05          CROSS TRACK  =  -1.003 M
RTK LINK  =    OK           SATS IN VIEW  =  11
DISTANCE FROM START POINT  =  4550.0 M
```

Figure 33-4   1. Error Code

NOTE

• **Viewing the Error Log screen clears the error codes from the Main Display screen until a new error is recorded.**

Valley GGS Control Panel

Diagnostics
Clearing An Error Code

To view and clear an error code from the Main Display screen, do the following:

1. Press the Diagnostics button DIAGNOSTICS and 2 to display the Error Log screen. This also clears the errors from the Main Display screen until new errors occur. See figure 34-1.

2. Press 1 (Search Backward) to view the next lower priority error. The higher the error number, the lower the priority. See figure 34-2.

```
0 EXIT
1 SEARCH BACKWARD
2 SEARCH FORWARD
PRESS NUMBER  >
```
Figure 34-1

```
E02  EEPROM  -  CHECKSUM  FAILED  AT
POWER  UP
FIRST  :14:26:33      06/21/99
LAST  :13:36:30       11/18/07          COUNT=  0
```
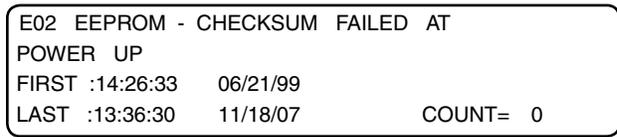Figure 34-2

Error Codes

A list of possible error codes appears below in figure 34-3. See the Troubleshooting section for possible causes and corrective actions.

E01 – BATTERY BACKED RAM - CHECKSUM FAILED AT POWER UP	A BBRAM memory error has occurred in the Control Panel Module.
E02 – EEPROM - CHECKSUM FAILED AT POWER UP	A EEPROM memory error has occurred in the Control Panel Module.
E03 – UNIT RESETS - THIS IS LOGGED WHEN THE SOFTWARE RESETS	The machine has reset for some reason.
E04 – KEYPAD - POSSIBLE KEY STUCK, CHECK KEYPAD CONNECTION	A key on the keypad is stuck and has been sending a continuous signal to the machine for at least 10 minutes.
E05 – RELAY BOARD COMMUNICATIONS ERROR, CHECK RELAY BOARD CABLE CONNECTIONS	The Control Panel Module could not communicate with the Relay Board.
E06 – GGS POWER OUT OF RANGE - CHECK GGS POWER SUPPLY OUTPUT AND CONNECTIONS	The GGS Computer was not receiving adequate power.
E07 – GGS POWER CYCLES - THIS IS LOGGED WHEN THE GGS POWER IS CYCLED	The Control Panel Module has cycled power to the GGS Computer and the GPS Receiver because the Control Panel Module temporarily lost communication with the GGS Computer.
E08 – GGS COMMUNICATIONS ERROR, CHECK GGS POWER AND SERIAL CABLE CONNECTIONS	Communication between the Control Panel Module and the GGS Computer was completely lost.
E09 – GPS COMMUNICATIONS ERROR, CHECK GPS POWER, SERIAL CABLE, AND CLEAR SKY VIEW	Communication between the GGS Computer and GPS Receiver was completely lost.
E10 – RTK REFERENCE COMMUNICATIONS ERROR, CHECK RTK REF POWER, SKY VIEW, AND RADIO LINK	The Rover GPS did not receive corrections from the GPS Reference Station for at least 60 seconds.
E11 – GPS SIGNAL ERROR, CHECK GPS CLEAR SKY VIEW	The signals that the Rover GPS is receiving from the satellites are not adequate for maintaining the location accuracy needed to guide the system.
E12 – GGS GUIDANCE ERROR, CHECK PATH TRACKING AND MACHINE POSITION TO PATH	The location of the Rover GPS was outside the safety band of the machine. This safety is +/- 2 meters on a Corner and +/- 1 meter on a Linear.

Figure 34-3

Diagnostics

Error Logs

For each error code there is an error log. Each entry in the log records the following information about the error:

- the time and date when it first occurred
- the time and date when it last occurred
- the total number of occurrences

See figure 35-1.

Viewing An Error Log

To view an Error Log, do the following:

1. Press the Diagnostics button (DIAGNOSTICS), (2), and (1) to display the E01 Error Log screen. See figure 35-2.

NOTE

- **Viewing the Error Log screen clears the error codes from the Main Display screen.**

2. Locate the desired error log:

- Press (1) to search backward through the Error Logs.

- Press (2) to search forward through the Error Logs.

3. Press the Escape key (ESC) to return to the menu.

- Press (ESC) a second time to return to the Main Display screen.

Resetting An Error Log To Zero

To reset an Error Log to zero, do the following:

4. Press the Diagnostics button (DIAGNOSTICS), (2), and (1) to display the E01 Error Log screen. See figure 35-3.

5. Locate the desired error log screen to reset. See figure 35-4.

- Press (1) to search backward through the Error Logs.

- Press (2) to search forward through the Error Logs.

6. Press the Back Arrow key (⇐) two times.

The count is reset to zero and the first and last occurrences are set to the current time and date. See figure 35-5.
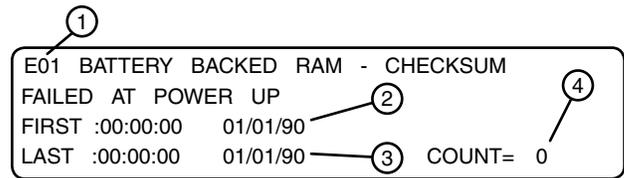

Figure 35-1   1. Error Code
2. First Occurrence Time and Date
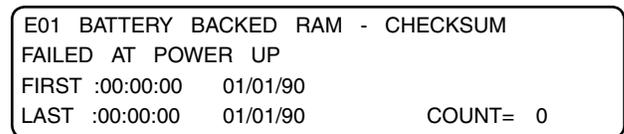3. Last Occurrence Time and Date
4. Total Occurrences

```
E01  BATTERY  BACKED  RAM  -  CHECKSUM
FAILED  AT  POWER  UP
FIRST :00:00:00     01/01/90
LAST  :00:00:00     01/01/90          COUNT=  0
```
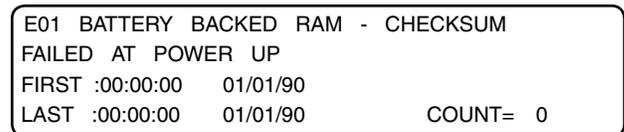
Figure 35-2

```
E01  BATTERY  BACKED  RAM  -  CHECKSUM
FAILED  AT  POWER  UP
FIRST :00:00:00     01/01/90
LAST  :00:00:00     01/01/90          COUNT=  0
```

Figure 35-3

```
E04  KEYPAD - POSSIBLE KEY STUCK,
CHECK KEYPAD CONNECTION
FIRST :07:23:23     07/08/07
LAST  :08:37:18     07/09/07          COUNT=  4
```

Figure 35-4   Selected Error Log

```
E04  KEYPAD - POSSIBLE KEY STUCK,
CHECK KEYPAD CONNECTION
FIRST :12:26:35     07/10/07
LAST  :12:26:35     07/10/07          COUNT=  0
```
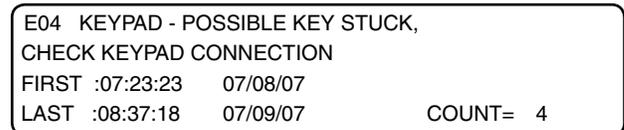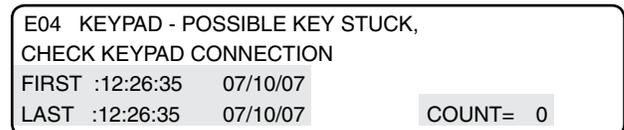
Figure 35-5

# Valley GGS Control Panel

Diagnostics
System Review Log

The System Review Log contains a record of up to 99 of the most recent machine operation status changes. Review 01 is the newest status change and Review 99 is the oldest status change. The review screen number appears in the lower left-hand corner. See figure 36-1.

You can analyze a status change further by displaying a record of all its related error codes. Reading from left to right, error codes E12 through E01 are represented by a 0 placeholder. If an error occurred, the placeholder representing the error code changes from 0 to 1. See figure 36-3.
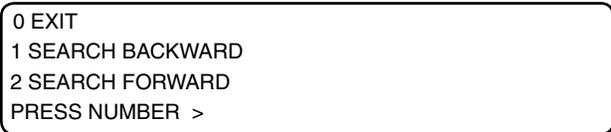
Reviewing Status Changes and Errors

To review status changes and error codes, do the following:

1. From the Status screen, press [DIAGNOSTICS], [3], and [1] to display System Review Log screen 01. See figure 36-1.

2. To view a different System Review Log screen, press [1] to search backward toward screen 99 or [2] to search forward toward screen 01. See figure 36-2.

3. While in the desired System Review Log screen, press [OPTIONS] to display the Error Review screen. See figure 36-3.

   Press [OPTIONS] again to return to the System Review Log screen.
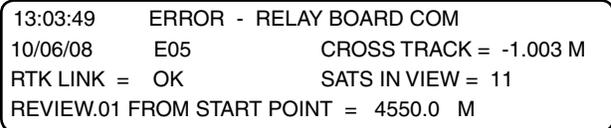
```
13:03:49        ERROR  -  RELAY BOARD COM
10/06/08        E05              CROSS TRACK = -1.003 M
RTK LINK  =   OK                SATS IN VIEW = 11
REVIEW.01 FROM START POINT  =   4550.0  M
```
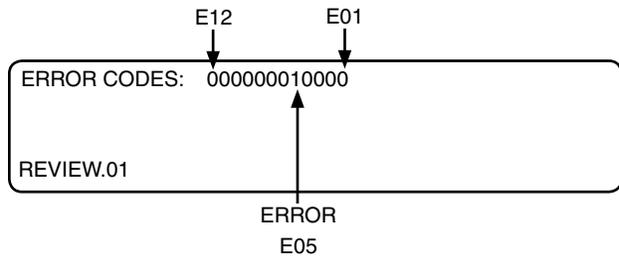Figure 36-1

```
0 EXIT
1 SEARCH BACKWARD
2 SEARCH FORWARD
PRESS NUMBER  >
```
Figure 36-2

Figure 36-3